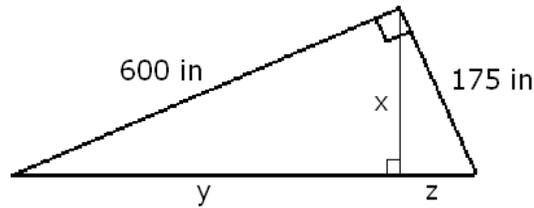1. Find x, y, and z based on the picture below.

2. We have the following data: $6, 3, 9, -2, 4, 1, 1, 1, 6, 11$. Find each of the following.

    (a) mean

    (b) median

    (c) mode

3. We roll two die. If the difference between the numbers rolled is less than 3, we pay \$2. Otherwise we receive \$5. Find the expected value of this game.

4. We have 20 marbles in a bag: 10 red, 6 blue, and 4 yellow. We randomly pull three marbles, without replacement. If we pull three marbles of the same color, we receive \$3. If we pull three marbles of three different colors, we receive \$2. In any other case, we pay \$1. Find the expected value of this game.

5. We have 10 marbles in a bag: 7 red, 2 blue, and 1 yellow. We randomly pull two marbles, without replacement. Find the expected value of the number of red marbles pulled.

6. We randomly pull a card from a standard deck of 52. If the card is the ace of spade, we receive \$20. If it is an ace but not spade, we receive \$10. If it is spade but not the ace, we receive \$5. In every other case, we pay \$3. Find the expected value for this game.

7. The height of a pyramid is 21. The base of the pyramid is the trapezoid determined by the points $A(-2, -5)$, $B(-2, 2)$, $C(4, -1)$, and $D(4, 4)$. Find the volume of the pyramid.

8. A rectangular prism has dimensions 2 in, 3 in, and 5 in. Find the length of the diagonal.
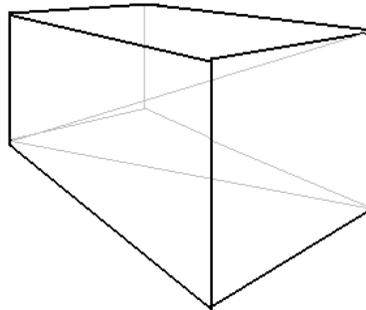
9. We toss three coins. What is the probability that the number of heads is two or three?

10. Find the present value of three annual payments of $500, starting with the first payment right now. Assume an annual compound interest rate of 6%, compounded

   (a) daily
   (b) continuously.

11. We have 10 marbles in a bag: all blue or red. We randomly pull a marble. If it is red, we pay $2. If it is blue, we receive $5. How many blue marbles are there in the bag if the expected value of this game is $0.80?

12. A healthy 40 year old male wishes to buy a health insurance policy for a year. The insurance would pay $100000 in case of death. The insurance complany charges $1000 for this policy. Statistical data tells us that a healthy 40 year old male has a 0.3 percent chance to die this year. Find the expected value of this policy

   (a) for the customer
   (b) for the insurance company.

13. Three cards are drawn from a deck of 52 cards.

   (a) What is the probability that we draw three clubs?
   (b) What is the probability that we draw three clubs, given that no hearts was drawn?

14. In a class with 40 students let M be the set of students who take math and P the set of students who take physics. If $n(M' \cap P') = 13$, $n(M) = 15$ and $n(P) = 20$, find the number of students who take both math and physics.

15. The following information is given about the sets A, B, and C.
   $n(U) = 36$, $n(A) = 12$, $n(B) = 15$, $n(C) = 12$,
   $n(A \cap B) = 4$
   $n(A \cap C) = 3$
   $n(B \cap C) = 5$
   $n(A \cap B \cap C) = 1$
   Find $n(A \cap B' \cap C')$.